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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/572,891

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Bert Braune

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COHEN, PONTANI, LIEBERMAN & PAVANE LLP  
551 FIFTH AVENUE  
SUITE 1210  
NEW YORK, NY 10176

EXAMINER

WILLIAMS, JOSEPH L

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/572,891	<b>Applicant(s)</b> BRAUNE ET AL.	
	<b>Examiner</b> Joseph L. Williams	<b>Art Unit</b> 2889	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 10 March 2010.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                    | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)         | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                          |

### DETAILED ACTION

This Action replaces the one mailed on 11/12/2009.

The response filed on 6/26/2009 has been entered.

#### *Double Patenting*

1. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the “right to exclude” granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

2. Claims 1-16 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-19 of copending Application No.

10/574,026. Although the conflicting claims are not identical, they are not patentably distinct from each other because of the following:

3. Copending ('026) claim 1 contains all of the limitations of present claim 1 with the exception the alternative limitation of emitting the primary radiation in the UV radiation region.

However, since the alternative feature of stated exception in present claim 1 is claimed in

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copending ('026) claim 1 that limitation does not patentably distinguish the two claims. Further the limitation "partially converts the radiation of the chip into green emission of dominant wavelength  $\lambda_{dom}=550$  to 570 nm" of present claim 1 is inherently taught by copending ('026) claim because both claims teach the same phosphor formula and then green color range can be achieved. Also, the second phosphor of the copending ('026) claim 1 is not excluded in the present claim 1 due to the fact that the present claim 1 uses the statement "comprising".

Copending ('026) claim 2 also contains all of the limitations of present claim 2.

Copending ('026) claim 3 also contains all of the limitations of present claim 3.

Copending ('026) claim 4 also contains all of the limitations of present claim 4.

Copending ('026) claim 5 also contains all of the limitations of present claim 5.

Copending ('026) claim 6 also contains all of the limitations of present claim 6.

Copending ('026) claim 8 also contains all of the limitations of present claim 11.

Copending ('026) claim 10 also contains all of the limitations of present claim 10.

Copending ('026) claim 12 also contains all of the limitations of present claim 8.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

### ***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an

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international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1-3, 8, 9, 16 and 17 are rejected under 35 U.S.C. 102(e) as being anticipated by Mueller (US 6,717,353), of record.

Regarding claim 1 Mueller disclose, a green-emitting LED which is designed as a luminescence conversion LED (figure 1), comprising: a primary radiation source, which is a chip emitting a primary radiation in the UV or blue radiations region (refer to lines 42 -58 column 2 where it is stated a light emitting device that is a Led that emits primary light of UV or blue radiations); and a layer of a phosphor which is arranged in front of the primary radiation source (refer to lines 52-56 of column 2) and completely or partially converts the radiation of the chip into green emission of dominant wavelength  $\lambda_{dom}=550$  to 570 nm (The graph of figure 1 shows the emission spectrum of the green phosphor Sr<sub>0.96</sub>Si<sub>2</sub>N<sub>2</sub>O<sub>2</sub>:Eu<sub>0.04</sub> after excitation refer to lines 16-23 of column 2); wherein the phosphor belongs to the class of the oxynitridosilicates, having a cation M and the empirical formula M(1-c)Si<sub>2</sub>O<sub>2</sub>N<sub>2</sub>:Dc, where D denotes a doping with divalent europium and where M comprises Sr as a constituent and M=Sr alone or M=Sr (1-x-y)BaCa<sub>x</sub> with 0 ≤ x ≤ 0.5 is used, the oxynitridosilicates completely or predominantly comprising the high-temperature-stable modification HT. The general of the green phosphor is given lines 16-23 of column 2 as (Sr<sub>1-a-b</sub>Ca<sub>b</sub>Ba<sub>c</sub>)Si<sub>x</sub>N<sub>y</sub>O<sub>z</sub>:Eu<sub>a</sub>, wherein a=0.002-0.2, b=0.0-0.25, c=0.0-0.25, x=1.5-2.5, y=1.5-2.5 and z=1.5-2.5. The claimed subscripts of "x" is equivalent to the Mueller's b, "y" is equivalent to Mueller's c, "c" is equivalent to Mueller's a. The claimed molar proportion of Si, O, and N all fall within the ranges of the prior art. Therefore the claimed green phosphor formula is clearly anticipated.

Regarding claim 2 Mueller disclose, the LED as claimed in claim 1, wherein the Eu fraction makes up between 0.1 and 20 mol % of M. Refer to lines 16-23 of column 2 where the range disclosed by Mueller is  $a=0.002-0.2$  which represent the molar percentage which anticipates the claim range.

Regarding claims 3 and 12 Mueller disclose, the LED as claimed in claim 1, wherein Sr represents the majority of M and a proportion of M, in particular up to 30 mol %, is replaced by Ba and/or Ca. In the lines 16-23 of column 2 where the ranges disclosed by Mueller of the variables b and c is from 0.0-0.25 molar percentage which anticipates the claim ranges.

Regarding claim 8 Mueller disclose, the LED as claimed in claim 1, characterized in that wherein the green emission has a dominant wavelength in the range from 556 to 564 nm. Line 33 column 3 and figure 8 anticipate this claim.

Regarding claim 9 Mueller disclose, the LED as claimed in claim 1, wherein the primary radiation is completely converted. Since the claimed chemical formula is completely anticipated by the prior art it is inherent that the primary radiation can be converted very efficiently. Refer to lines 35-43 of column 3 for further explanation.

Regarding claim 16 Mueller disclose, the LED as claimed in claim 1, wherein a primary radiation has a peak wavelength of at least 380 nm. Refer to Figure 1 where the excitation spectrum is shown.

Regarding claim 17, Mueller discloses that the impurities (in general) should be less than 100 ppm.

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 4-7, 10, and 13-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mueller (US 6,717,353) in view of Ellens et al. (US 2003/0094891), both of record.

Regarding claims 4 and 13 Mueller disclose, the LED as claimed in claim 1.

But Mueller fails to teach wherein a proportion of M, in particular up to 30 mol %, is replaced by Li and/or La and/or Zn.

However Ellens teaches in paragraphs [0042], [0063] - [0065] that M can be La or Sr by there self and that those can be put in combination with host novel optical elements of Si<sub>2</sub>O<sub>2</sub>N<sub>2</sub> or SiAl<sub>3</sub>O<sub>3</sub>N. The novel hosts are very stable thermally and chemically and are of the same basic tetrahedral structure. The motivation to combine Ellens use of M=La with the host lattice and dopant of Mueller to achieve, the predictable result, of different color hue and saturation.

Therefore it would have been obvious to one of ordinary skill in the art, at the time of the invention was made, to combine Mueller's host lattice and dopant with Ellens' M=La. Both the Ellens and Mueller are directed to the same problem sought to be solved (optimizing LED phosphor) and to change the color hue and saturation of the phosphor emission spectrum of the LED. Regarding claims 5 and 14 Mueller disclose, the LED as claimed in claim 1. But Mueller fails to teach wherein part of the SiN group in the oxynitridosilicates of formula MSi<sub>2</sub>O<sub>2</sub>N<sub>2</sub>, in particular up to 30 mol %, is replaced by the AlO group.

However Ellens teaches in paragraphs [0043] - [0044] and [0063] the replacement SiN group with the AlO group. The motivation to combine is provide in paragraphs [0063] and [0064] where it states the optically active materials of  $\text{Sr}_2\text{SiO}_4$  or  $\text{Sr}_2\text{SiO}_4$  can be substituted for each other since both have the same basic tetrahedral structure and the amount of nitride shifts the color spectrum.

Therefore it would have been obvious to one of ordinary skill in the art, at the time of the invention was made, to substitute Mueller's host lattice with Ellens' host lattice. Both the Ellens and Mueller are directed to the same problem sought to be solved (optimizing LED phosphor) and the optically active materials can be substituted for each other since both have the same basic tetrahedral structure.

Regarding claims 6 and 15 Mueller disclose, the LED as claimed in claim 1.

But Mueller fails to teach wherein a proportion of Eu, in particular up to 30 mol %, is replaced by Mn.

However Ellens teaches in lines [0061 ] the co-doping of Eu with  $\text{Mn}^{2+}$  up to 4 times the amount of Eu which is more than 30 mol %. Ellens also provides motivation to combine in paragraph [0061 ] where he states the combination of co-doping allows for energy transfer to the co-dopant which will shift the peak emission characteristic.

It would have been obvious to one of ordinary skill in the art, at the time of the invention was made, to replace some Mueller's dopant with Ellens' dopant. Both the Ellens and Mueller are in the same field of endeavor (Light Emitting Devices) and are directed to the same problem sought to be solved (optimizing LED phosphor) and co-doping allows for energy transfer to the co-dopant which will shift the peak emission characteristic.



Regarding claim 7 Mueller disclose, the LED as claimed in claim 1, But Mueller fails to teach wherein the primary emission has a peak wavelength in the range from 380 to 430 nm, in particular at least 380 nm.

However Ellens teaches wherein the primary emission has a peak wavelength in the range from 380 to 430 nm, in particular at least 380 nm refer to paragraph [0077]. Motivation to combine is to provide adequate energy to excite the phosphor to exhibit the full green color emission.

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention made to combine Mueller's LED with Ellens primary emission range is to provide adequate energy to excite the phosphor to exhibit the full green color emission. Both the Ellens and Mueller are directed to the same problem sought to be solved (optimizing LED phosphor).

Regarding claim 10 Mueller discloses, the LED as claimed in claim 1. But Mueller fails to teach wherein the chip is an InGaN chip with a peak emission wavelength in the range from 430 to 465 nm.

However Ellens teaches wherein the chip is an InGaN chip (Figure 1, Chip (1), refer to paragraph [0084]) with a peak emission wavelength in the range from 430 to 465 nm.

The motivation to combine is to provide adequate energy to excite the phosphor to exhibit the full green color emission.

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Mueller's LED with Ellens primary emission range is to provide adequate energy to excite the phosphor to exhibit the full green color emission. Both the Ellens and Mueller are directed to the same problem sought to be solved (optimizing LED phosphor).

Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent 6,717,353 to Mueller et al, herein refer to as Mueller.

Regarding claim 11, Mueller disclose, the LED as claimed in claim 1, wherein the LED is dimmable. It would have been at least obvious to one of ordinary skill in the art at the time the invention was made that the LED can be dimmable by reducing the current input, as in accordance to needs.

### ***Response to Arguments***

7. Applicant's arguments filed 6/26/2009 have been fully considered but they are not persuasive.

8. Applicant argues that the prior art reference, Mueller (US 6,717,353 B1 ), does not anticipate claim 1 because it does not disclose either the first or the second claimed phosphor. This argument is not found to be convincing. Although the notation is slightly different, the claimed first and second phosphors are encompassed by the first and second phosphors disclosed by Mueller. For example, for the first phosphor, the claim requires that the relative amount of Si is 2, while Mueller specifies that the relative amount of Si is between 1.5 and 2.5. Similarly, for the second phosphor, claim 1 requires that the dopants be Sr and Ca, while Mueller specifies that dopants are Sr with Ce and/or Ba. Therefore, the phosphors of claim 1 are anticipated by those disclosed by Mueller.

***Conclusion***

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joseph L. Williams whose telephone number is (571) 272-2465. The examiner can normally be reached on M-F (6:30 AM-3:00 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Minh-Toan Ton can be reached on (571) 272-2303. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Joseph L. Williams/  
Primary Examiner, Art Unit 2889